June 14, 2006

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OVERALL SUMMARY FOR CARBAMIC ACID[(DIMETHYLAMINO)IMINOMETHYL]METHYL-, ETHYL ESTER, MONOHYDROCHLORIDE

Summary

Carbamic acid[(dimethylamino)iminomethyl]methyl-, ethyl ester, monohydrochloride is a solid that is soluble in water at greater than 50% concentration. This chemical is also referred to in this document as carbamate hydrochloride or F3455.HCl. No data are available on its melting point, and boiling point, density, and vapor pressure data are not applicable to this chemical. The product as shipped is a liquid, which contains F3455.HCl (35-51%), water (34-40%), dimethylamine hydrochloride (5-14%), and trimethylguanidine hydrochloride (1-5%). The product as shipped has a boiling point of 105°C, a liquid density of 69.7 lb/ft^3 at 23°C, and a vapor pressure of 18 mm Hg at 21°C.

A review of estimated physical-chemical properties and environmental-fate characteristics based on output from EPIWIN 3.05 modeling software (Syracuse Research Corporation) indicates that F-3455.HCl is unlikely to represent a hazard as a persistent and/or bioaccumulative chemical (See Table 1). When modeled using a Level III fugacity model under a standard scenario of equal emissions to air, water, and soil, F-3455.HCl is expected to partition primarily into soil and water compartments. When dissolved in water at environmental pH, F-3455.HCl is expected to be mostly in an ionized form. Hydrolytic decomposition is not expected to readily transform F-3455.HCl, but F-3455.HCl may be subject to aqueous photolysis. In an OECD Guideline 111 hydrolysis test, F-3455.HCl was hydrolytically stable at pH 4. F-3455.HCl was hydrolytically unstable at temperatures of 50°C and above for pH 7 and at temperatures of 10°C and above for pH 9. In an indirect photolysis model (AOPWIN), the estimated half-life due to vapor phase OH radical reaction is 5.01 hours. Based on the BIOWIN ultimate survey model, F-3455.HCl, is expected to readily biodegrade. Because some inconsistencies were recognized in the modeling results for biodegradation, a ready biodegradability test, OECD Guideline 301, was run. F-3455.HCl reached a maximum biodegradability of 2% by test day 21 and was considered not "ready biodegradable".

Table 1 : Environmental Fate

Bioaccumulation*	BCF = 3.162
Biodegradation	Not "Ready biodegradable"
Fugacity*	Level III Partition Estimate Air 0.005% Water 45% Soil 54.9% Sediments 0.08%
* Modeled data	

OECD Guideline tests conducted in fish (*Oncorhynchus mykiss*), *Daphnia magna*, algae (*Pseudokirchneriella subcapitata*) and aquatic plants (*Lemna gibba G3*) indicate that F3455.HCl is unlikely to be acutely toxic to aquatic species. The 96-hour EC_{50} in *Oncorhynchus mykiss* was > 114 mg/L, the 48-hour EC_{50} in *Daphnia magna* was > 119 mg/L, the 72-hour EC_{50} in algae (*Pseudokirchneriella subcapitata)* was > 120 mg/L and the 7-day EC_{50} in *Lemna gibba* G3 was > 120 mg/L (See Table 2). Syracuse Research Corporation models for estimating physical-chemical properties were used to estimate log_{10} Kow (Meylan and Howard, 1995) for subsequent use in the ECOSAR program. ECOSAR (Meylan and Howard, 1999) was used to estimate aquatic toxicity data for green algae, daphnids (planktonic freshwater crustaceans), and fish. ECOSAR predictions are based on actual toxicity test data for classes of compounds with similar modes of action. The ECOSAR predictions also indicate that F3455.HCl is unlikely to be acutely toxic to algae, invertebrates, or fish at environmentally relevant concentrations.

Table 2: Predicted Aquatic Toxicity Values

Parameter	**Estimated Value**	**Measured Value**
Log Kow	-3.96 @ 25°C	
96-hour LC_{50} (fish)	6.22×10^{7} mg/L	> 114 mg/L (*Oncorhynchus mykiss*)
48-hour EC_{50} (daphnid)	4.42×10^{7} mg/L	> 119 mg/L (*Daphnia magna*)
96-hour EC_{50} (green algae)	1.96×10^{7} mg/L	72-hour EC_{50} (growth rate, cell count, area under the curve) > 120 mg/L (*Pseudokirchneriella subcapitata*) 7-day EC_{50} > 120 mg/L (*Lemna gibba G3*)

The product as shipped has very low acute oral toxicity with an acute lethal dose (ALD) of > 11,000 mg/kg in rats. Lethargy was observed on the day of dosing in animals administered 7500 and 11,000 mg/kg. Slight initial weight loss was evident at 670, 1500, 3400, 7500, and 11,000 mg/kg.

F3455.HCl was negative in a bacterial reversion mutation assay conducted according to OECD Guideline 471 and negative in a chromosome aberration test using human peripheral blood lymphocytes conducted according to OECD Guideline 473.

DuPont handles carbamate hydrochloride as an isolated intermediate.[1] While classification as such would alleviate the need to conduct a repeated dose and reproductive toxicity study, a developmental toxicity study would still be needed to satisfy the program requirements. Since the OECD 422 study would satisfy the developmental toxicity endpoint, as well as provide repeated dose and reproductive data, this test was conducted. Male and female rats were administered 0, 50, 250, or 1000 mg/kg F3455.HCl via gavage. Effects considered related to treatment were limited to the 1000 mg/kg group and consisted of mildly increased triglycerides and moderately increased total bile acid in the P1 females and a small increase in liver weights in the P1 females. The NOEL for systemic toxicity was 250 mg/kg. The NOEL for reproductive toxicity and developmental screening was 1000 mg/kg, the highest level tested.

Human Exposure Information

F3455.HCl is manufactured at the DuPont Belle Plant and shipped to the DuPont LaPorte Plant. DuPont LaPorte is the only customer. The sites can have from 2 to 10 personnel working (construction, contractor, and plant employees) in the F3455.HCl operating areas. The areas where the substance is manufactured will have 2 operators present per shift during normal operations and 5 to 10 people during a shutdown or major construction activity.

The F3455.HCl is not present in the distributed product. There are a series of chemical reaction steps, and the F3455.HCl is consumed by chemical reaction. Chemical analysis of the product sold in commerce shows no detectable amount. The detection limit is estimated to be 0.1 wt% based on liquid chromatography.

Transport between the two locations is via dedicated rail cars or trucks. The F3455.HCl is shipped in bulk as the hydrochloride salt in water. Annual volume is 2.5-3 million pounds transported.

Controls during transport and transfer at the dispatching and receiving site are designed to ensure a closed system. This solution is pumped directly from the reactor to the railcar or truck for shipment. Normal shipment is by railcar. During loading of the railcar, the railcar dome is vented to the atmosphere. Because the aqueous salt solution has a low vapor pressure, the only significant exposure risk is as a result of a spill during loading of the railcar or truck. For railcars, spill containment including a stainless steel catch pan with a double-lined sump is provided for spill protection. Railcars are inspected to maintain the integrity of the fleet. The bottom valve of tank cars or trucks is checked by DuPont Belle operators when loading first starts (plug is removed to look for any liquid that may have leaked through the valve). The operator who loads the car wears appropriate PPE to guard against splashes. A checklist is completed for each shipment, to ensure that standard procedures are followed. Any spills, water used to wash equipment, etc., is sent to the biological treatment system on-site.

On receipt of the product at DuPont LaPorte, the solution is again handled in a closed system that includes pumping from the railcar or truck to the storage tank. It is consumed in the

[1] As defined by EPA guidance, an isolated intermediate is one in which there is controlled transport, i.e. to a limited number of locations within the same company or second parties that use the chemical in a controlled way as an intermediate with a well known technology.

manufacturing process in a closed pipe and reactor system. The only significant exposure risk is during the unloading operation. The unloading spot is equipped with spill containment (catch pan) and the storage tank is diked. Any spills in these containment areas are disposed of by on-site incineration or biological treatment. Both the unloading spot and the storage tank vent to a flare. Unloading operators or others that might perform first breaks into equipment wear PPE to guard against splashes.

References for the Summary

Meylan, W. M. and P. H. Howard (1995). J. Pharm. Sci., 84:83-92.

Meylan, W. M. and P. H. Howard (1999). User's Guide for the ECOSAR Class Program, Version 0.993 (Mar 99), prepared for J. Vincent Nabholz and Gordon Cas, U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, Washington, DC, prepared by Syracuse Research Corp., Environmental Science Center, Syracuse, NY 13210 (submitted for publication).

TEST PLAN FOR CARBAMIC ACID[(DIMETHYLAMINO)IMINOMETHYL]METHYL-, ETHYL ESTER, MONOHYDROCHLORIDE

Carbamate Hydrochloride CAS No. 65086-85-3	Data Available	Data Acceptable	Testing Required
Study	**Y/N**	**Y/N**	**Y/N**
PHYSICAL/CHEMICAL CHARACTERISTICS			
Melting Point	Y	Y	N
Boiling Point	Y	Y	N
Vapor Pressure	Y	Y	N
Partition Coefficient	Y	Y	N
Water Solubility	Y	Y	N
ENVIRONMENTAL FATE			
Photodegradation	Y	Y	N
Stability in Water	Y	Y	N
Transport (Fugacity)	Y	Y	N
Biodegradation	Y	Y	N
ECOTOXICITY			
Acute Toxicity to Fish	Y	Y	N
Acute Toxicity to Invertebrates	Y	Y	N
Acute Toxicity to Aquatic Plants	Y	Y	N
MAMMALIAN TOXICITY			
Acute Toxicity	Y	Y	N
Repeated Dose Toxicity	Y	Y	N
Developmental Toxicity	Y	Y	N
Reproductive Toxicity	Y	Y	N
Genetic Toxicity Gene Mutations	Y	Y	N
Genetic Toxicity Chromosomal Aberrations	Y	Y	N

Y = Yes
N= No
N/A = Not Applicable

I U C L I D

Data Set

Existing Chemical	:	ID: 65086-85-3
CAS No.	:	65086-85-3
Substance name	:	Carbamic acid[(dimethylamino)iminomethyl]methyl-, ethyl ester, monohydrochloride

Producer related part

Company	:	E. I. du Pont de Nemours and Company
Creation date	:	21.12.2005

Substance related part

Company	:	E. I. du Pont de Nemours and Company
Creation date	:	21.12.2005
Status	:	
Memo	:	
Printing date	:	14.06.2006
Revision date	:	
Date of last update	:	23.03.2006
Number of pages	:	34
Chapter (profile)	:	Chapter: 1, 2, 3, 4, 5, 6, 7, 8, 10
Reliability (profile)	:	Reliability: without reliability, 1, 2, 3, 4
Flags (profile)	:	Flags: without flag, confidential, non confidential, WGK (DE), TA-Luft (DE), Material Safety Dataset, Risk Assessment, Directive 67/548/EEC, SIDS

1.0.1 APPLICANT AND COMPANY INFORMATION

1.0.2 LOCATION OF PRODUCTION SITE, IMPORTER OR FORMULATOR

1.0.3 IDENTITY OF RECIPIENTS

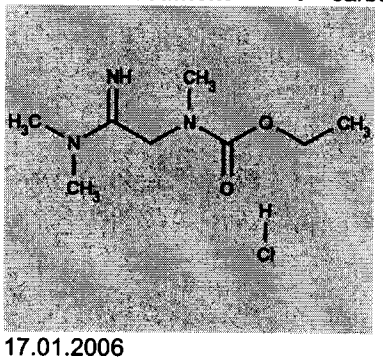
1.0.4 DETAILS ON CATEGORY/TEMPLATE

1.1.0 SUBSTANCE IDENTIFICATION

1.1.1 GENERAL SUBSTANCE INFORMATION

Purity type	:	
Substance type	:	
Physical status	:	solid
Purity	:	
Colour	:	
Odour	:	

Attached document : carbamate hydrochloride structure.bmp



17.01.2006

1.1.2 SPECTRA

1.2 SYNONYMS AND TRADENAMES

Carbamate hydrochloride

21.12.2005

Carbamic acid, (aminoiminomethyl)methyl-, dimethyl deriv., ethyl ester monohydrochloride

21.12.2005

Carbamic acid[(dimethylamino)iminomethyl]methyl-, ethyl ester, monohydrochloride

21.12.2005

F-3455.HCl

21.12.2005

1.3 IMPURITIES

1.4 ADDITIVES

1.5 TOTAL QUANTITY

1.6.1 LABELLING

1.6.2 CLASSIFICATION

1.6.3 PACKAGING

1.7 USE PATTERN

1.7.1 DETAILED USE PATTERN

1.7.2 METHODS OF MANUFACTURE

1.8 REGULATORY MEASURES

1.8.1 OCCUPATIONAL EXPOSURE LIMIT VALUES

1.8.2 ACCEPTABLE RESIDUES LEVELS

1.8.3 WATER POLLUTION

1.8.4 MAJOR ACCIDENT HAZARDS

1.8.5 AIR POLLUTION

1.8.6 LISTINGS E.G. CHEMICAL INVENTORIES

1.9.1 DEGRADATION/TRANSFORMATION PRODUCTS

1.9.2 COMPONENTS

1.10 SOURCE OF EXPOSURE

1.11 ADDITIONAL REMARKS

Remark : Existing published and unpublished data were collected and scientifically evaluated to determine the best possible study or studies to be summarized for each required endpoint. In the spirit of this voluntary program, other data of equal or lesser quality are not summarized, but are listed as related references at the end of each appropriate section, with a statement to reflect the reason why these studies were not summarized.

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1.12 LAST LITERATURE SEARCH

1.13 REVIEWS

2.1 MELTING POINT

Value	:	-49.4 °C
Sublimation	:	
Method	:	
Year	:	
GLP	:	no data
Test substance	:	other TS
Remark	:	Freezing point Reliability: Not assignable because limited study information was available.
Test substance	:	Product as shipped

05.01.2006

(5)

2.2 BOILING POINT

Value	:	105 °C at
Decomposition	:	
Method	:	
Year	:	
GLP	:	no data
Test substance	:	other TS
Remark	:	Reliability: Not assignable because limited study information was available.
Test substance	:	Product as shipped

05.01.2006

(5)

2.3 DENSITY

Type	:	
Value	:	1.116 g/cm³ at 23 °C
Method	:	
Year	:	
GLP	:	no data
Test substance	:	other TS
Remark	:	Reliability: Not assignable because limited study information was available.
Result	:	69.7 lb/ft3
Test substance	:	Product as shipped

05.01.2006

(5)

2.3.1 GRANULOMETRY

2.4 VAPOUR PRESSURE

Value	:	23.99 hPa at 21 °C
Decomposition	:	
Method	:	
Year	:	
GLP	:	no data
Test substance	:	other TS
Remark	:	Reliability: Not assignable because limited study information was available.

Result : 18 mm Hg
Test substance : Product as shipped
05.01.2006

(5)

2.5 PARTITION COEFFICIENT

Partition coefficient :
Log pow : -3.96 at 25 °C
pH value :
Method : other (calculated): modeled
Year :
GLP : no
Test substance : as prescribed by 1.1 - 1.4

Method : Modeled. KOWWIN, v. 1.66, module of EPIWIN 3.05 (Syracuse Research Corporation).

KOWWIN uses "fragment constant" methodologies to predict log P.
Remark : Reliability: Estimated value based on an accepted model.
17.01.2006

(25)

2.6.1 SOLUBILITY IN DIFFERENT MEDIA

Solubility in : Water
Value : at °C
pH value :
concentration : at °C
Temperature effects :
Examine different pol. :
pKa : at 25 °C
Description :
Stable :

Remark : Reliability: Not assignable because limited study information was available.
Result : At least 50%
17.01.2006

(6)

Solubility in : Water
Value : at °C
pH value :
concentration : at °C
Temperature effects :
Examine different pol. :
pKa : at 25 °C
Description :
Stable :

Remark : Reliability: Not assignable because limited study information was available.
Result : Infinite
Test substance : Product as shipped
21.12.2005

(6)

2.6.2 SURFACE TENSION

2.7 FLASH POINT

Value	:	60 °C
Type	:	
Method	:	other: TCC
Year	:	
GLP	:	no data
Test substance	:	other TS
Remark	:	Reliability: Not assignable because limited study information was available.
Test substance	:	Product as shipped

05.01.2006

(5)

2.8 AUTO FLAMMABILITY

2.9 FLAMMABILITY

2.10 EXPLOSIVE PROPERTIES

2.11 OXIDIZING PROPERTIES

2.12 DISSOCIATION CONSTANT

2.13 VISCOSITY

2.14 ADDITIONAL REMARKS

3.1.1 PHOTODEGRADATION

Deg. product	:	
Method	:	other (calculated): Inspection of chemical structure
Year	:	
GLP	:	no
Test substance	:	as prescribed by 1.1 - 1.4
Remark	:	Reliability: Estimate based on known qualitative structure-activity relationships.
Result	:	Direct Photolysis: Inspection of F-3455.HCl indicates that it may be subject to aquatic photodegradation. Indirect Photolysis: The estimated half-life due to vapor phase OH radical reaction is 5.01 h.

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(2) (16) (24)

3.1.2 STABILITY IN WATER

Type	:	abiotic
t1/2 pH4	:	at °C
t1/2 pH7	:	20.3 at 50 °C
t1/2 pH9	:	18.6 at 20 °C
Deg. product	:	
Method	:	OECD Guide-line 111 "Hydrolysis as a Function of pH"
Year	:	2005
GLP	:	yes
Test substance	:	as prescribed by 1.1 - 1.4
Method	:	The procedures used in the test were based on the recommendations of the following guidelines: OECD Guideline 111, US EPA Pesticide Assessment Guideline 161-1, and SETAC EUROPE (1995) "Procedures for assessing environmental fate and ecotoxicity of pesticides". The hydrolysis of the test substance in sterile aqueous solutions buffered at pH levels of 4, 7, and 9 was investigated at varying temperatures for up to 30 days. For the preliminary experiment, buffer solutions of pH 4, 7, and 9 were fortified with the test substance, maintained for 5 days at 50.4±0.2°C, and then analyzed by HPLC\UV for the test substance. For the definitive experiment, buffer solutions of pH 7 and 9 were fortified with the test substance, maintained for up to 30 days at various temperatures, and then analyzed by HPLC\UV for the test substance.
Remark	:	Reliability: High because a scientifically defensible or guideline method was used.
Result	:	For the preliminary experiment, after 5 days the test substance concentration was greater than 90% of the initial day 0 concentration for the pH 4 samples, indicating that the test substance was hydrolytically stable at pH 4. The mean of the day 5 concentrations as percent of the day 0 concentrations for pH 7 and 9 were 53 and 2%, respectively,

prompting initiation of the definitive (Tiers 2 and 3) experiment.

For the definitive experiment, the mean of the last sampling event as a percent of the day 0 concentrations were 98.4, 35.1, and 22.9% for pH 7 samples at 25, 50, and 60°C, respectively. The mean test substance concentration was 73.7, 33.0, and 20.2% of the initial day 0 concentration for the pH 9 samples at 10, 20, and 30°C, respectively. On the basis of these results, the test substance was considered hydrolytically unstable at temperatures of 50°C and above for pH 7 and at temperatures of approximately 10°C and above for pH 9.

Using the definitive experiment analysis data, the following DT50 values were estimated for the test systems:

The pH 7, 25°C test system did not exhibit hydrolysis; therefore no DT50 calculation was performed.

The pH 7, 50 and 60°C test system DT50's were estimated to be 20.26 and 5.56 days, respectively.

The pH 9, 10, 20, and 30°C test system DT50's were estimated to be 77.09, 18.6, and 4.98 days, respectively.

The hydrolysis product was determined to be 1,1,3-trimethyl guanidine by LC-MS/MS analysis.

Hydrolysis rate was directly proportional to an increase in pH and temperature, which indicated that hydrolysis could be a major dissipation route of the test substance under certain environmental conditions.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

17.01.2006 (8)

Type :
t1/2 pH4 : at °C
t1/2 pH7 : > 10 year at °C
t1/2 pH9 : at °C
Deg. product :
Method : other: modeled
Year :
GLP : no
Test substance : as prescribed by 1.1 - 1.4

Method : Modeled. HYDROWIN, v. 1.67 module of EPIWINN v3.05 (Syracuse Research Corporation). HYDROWIN estimates aqueous hydrolysis rate constants for the following chemical classes: esters, carbamates, epoxides, halomethanes and selected alkyl halides. HYDROWIN estimates acid- and base-catalyzed rate constants; it does NOT estimate neutral hydrolysis rate constants. The prediction methodology was developed for the U.S. Environmental Protection Agency and is outlined in Mill et al., 1987.

Remark : Reliability: Estimated value based on an accepted model.
Result : Hydrolyses very slowly (> 10 years at pH 7) in water.

17.01.2006 (27)

3.1.3 STABILITY IN SOIL

3.2.1 MONITORING DATA

3.2.2 FIELD STUDIES

3.3.1 TRANSPORT BETWEEN ENVIRONMENTAL COMPARTMENTS

Type	:	fugacity model level III
Media	:	other: Air, Water, Soil, and Sediments
Air	:	% (Fugacity Model Level I)
Water	:	% (Fugacity Model Level I)
Soil	:	% (Fugacity Model Level I)
Biota	:	% (Fugacity Model Level II/III)
Soil	:	% (Fugacity Model Level II/III)
Method	:	
Year	:	

Method : Input Values:

SMILES: O=C(OCC)N(C)C(=N(H)(H)(CL))N(C)C
Molecular Weight: 209.68
Henry's Law Constant: 2.88E-019 atm-m3/mole (HENRYWIN program)
Vapor Pressure: 1.37E-007 mm Hg (MPBPWIN program)
Liquid Vapor Pressure: 3.82E-006 mm Hg (super-cooled)
Melting Point: 171°C (MPBPWIN program)
Log Kow: -3.96 (KOWWIN program)
Soil Koc: 4.5E-005 (calc by model)

Adsorption Coefficient: Log Koc = 0.349

Volatility: Henry's Law Constant = 1.53 x 10E-10 atm-m2/mole

Modeled, using 50% (w/v) water solubility value.

Henry's Law Constant - HENRYWIN v. 3.10 module of EPIWIN v3.05 (Syracuse Research Corporation). Henry's Law Constant (HLC) is estimated by two separate methods that yield two separate estimates. The first method is the bond contribution method and the second is the group contribution method. The bond contribution method is able to estimate many more types of structures; however, the group method estimate is usually preferred (but not always) when all fragment values are available.

Log Koc - Calculated from log Kow by the Mackay Level III fugacity model incorporated into EPIWIN v3.05 (Syracuse Research Corporation).

Environmental Distribution - Mackay Level III fugacity model, in EPIWIN v3.05 (Syracuse Research Corporation). Emissions (1000 kg/hr) to air, water, and soil compartments.

Fugacity - The methodology and programming for the Level III fugacity model incorporated into EPIWIN v3.05 (Syracuse Research Corporation) were developed by Dr. Donald MacKay and coworkers.

Remark : Reliability: Estimated value based on an accepted model.

Result : Compartment | % of total distribution | ½ life (hours) (advection + reaction)

Compartment	% of total distribution	½ life (hours) (advection + reaction)
Air	0.005	15.1
Water	45	360
Soil	54.9	720
Sediment	0.08	3240

17.01.2006 (17) (20) (21) (22) (23)

3.3.2 DISTRIBUTION

3.4 MODE OF DEGRADATION IN ACTUAL USE

3.5 BIODEGRADATION

Type	:	
Inoculum	:	activated sludge
Contact time	:	
Degradation	:	2 (±) % after 21 day(s)
Result	:	other: not "ready biodegradable"
Deg. product	:	
Method	:	OECD Guide-line 301 B "Ready Biodegradability: Modified Sturm Test (CO_2 evolution)"
Year	:	2005
GLP	:	yes
Test substance	:	as prescribed by 1.1 - 1.4

Method : The test substance was tested for ready biodegradability using the 28-day CO_2 evolution test for "ready biodegradation" according to OECD Guideline 301B in the version dated July 17, 1992. This test is also known as the Modified Sturm Test. The biological system used was secondary activated sludge from the Wilmington DE Publicly-Owned Treatment Works (POTW).

At 0, 2, 4, 7, 10, 14, 21, and 28 days the carbon dioxide (CO_2) trapped in the barium hydroxide was measured by titration of the residual hydroxide. The amount of CO_2 produced from the test substance (corrected for that derived from the blank inoculum) was expressed as a percentage of the total CO_2 that the test material could have theoretically produced based on carbon composition ($ThCO_2$). Test substances giving a result of greater than 60% yield of CO_2 (within 28 days) should be regarded as readily biodegradable. The level must be reached within 10 days of biodegradation exceeding 10% within the 28-day period of the test.

The positive control substance was sodium benzoate. The toxicity control was mineral medium with inoculum.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : The test substance reached a maximum biodegradability of 2% by day 21. Greater than 60% biodegradability was not reached within 10 days of exceeding 10% biodegradation.

In the toxicity test, which includes both the test substance and the positive control chemical in the same flask, the substances yielded greater than 25% biodegradation within 3 days.

The reference chemical attained a biodegradation level of 63% by day 13.

The test substance was not "ready biodegradable." The test substance was not inhibitory to microorganisms in the inoculum.

17.01.2006 (7)

Deg. product	:	
Method	:	
Year	:	
GLP	:	no

Test substance	:	as prescribed by 1.1 - 1.4
Method	:	Modeled. BIOWIN, v. 4.0 module of EPINWIN v3.05 (Syracuse Research Corporation). BIOWIN estimates the probability for the rapid aerobic biodegradation of an organic chemical in the presence of mixed populations of environmental microorganisms. Estimates are based upon fragment constants that were developed using multiple linear and non-linear regression analyses.
Remark	:	Reliability: Estimated value based on an accepted model.
Result	:	Estimated half-life: 15 days, estimated to be readily biodegradable. Ultimate Biodegradation Timeframe: Weeks Breakdown Products: No Data

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3.6 BOD5, COD OR BOD5/COD RATIO

3.7 BIOACCUMULATION

BCF	:	3.16
Elimination	:	
Method	:	
Year	:	
GLP	:	
Test substance	:	as prescribed by 1.1 - 1.4
Method	:	Modeled. BCFWIN v. 2.4 module of EPINWIN v3.05 (Syracuse Research Corporation). BCFWIN estimates the bioconcentration factor (BCF) of an organic compound using the compound's log octanol-water partition coefficient (Kow) with correction factors based on molecular fragments. BCF was calculated using a Log Kow of -3.96
Remark	:	Reliability: Estimated value based on an accepted model.

23.03.2006 (1)

3.8 ADDITIONAL REMARKS

4.1 ACUTE/PROLONGED TOXICITY TO FISH

Type	:	static
Species	:	Oncorhynchus mykiss (Fish, fresh water)
Exposure period	:	96 hour(s)
Unit	:	mg/l
LC50	:	> 114
Limit test	:	yes
Analytical monitoring	:	yes
Method	:	OECD Guide-line 203 "Fish, Acute Toxicity Test"
Year	:	2005
GLP	:	yes
Test substance	:	as prescribed by 1.1 - 1.4

Method : The procedures used in the test were based on the recommendations of the following guidelines:

OECD Guideline 203 and

US EPA Pesticide Assessment Guidelines Subdivision E, 72-1.

The study was conducted with a 120 mg/L nominal concentration and a dilution water control at a mean temperature of approximately 12.4°C. One dilution water control and 3 replicate limit test concentration chambers with 10 fish in each chamber were used for testing (total of 10 fish in the control and 30 fish in the limit test concentration). Fish in the dilution water control ranged from 3.9 to 4.4 cm in standard length (mean 4.1 cm) and 0.666 to 1.012 g in wet weight, blotted dry (mean 0.840 g) at test end. Control loading at test end was 0.420 g/L.

The test substance solutions were prepared by addition of the test substance to dilution water. The limit test solutions were prepared by adding approximately 2.4 g of test material to each of three 26-L stainless steel tanks, bringing each tank to a final volume of 20 L with laboratory well water, and stirring for approximately 40 minutes. Test solutions were clear and colorless with no visible precipitate. The nominal limit test concentration of 120 mg/L was chosen for the definitive limit test based on results of a preliminary rangefinding study.

Fish were not fed for approximately 26.5 hours prior to, nor during the test and were assigned to the test chambers using random numbers. Mortality counts and observations were made daily during the 96-hour exposure period. The test solutions were not aerated, and temperature was maintained at approximately 12.4°C. Photoperiod was maintained at 16 hours light:8 hours dark.

Dissolved oxygen, pH, and temperature were measured in all replicates of the dilution water control and limit test concentration at the beginning of the test, every 24 hours thereafter, and at test end. Total alkalinity, hardness (EDTA), and conductivity of the dilution water control and the limit test concentration were measured on samples collected at the beginning of the test.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : The mean measured value of the test substance was 95% of the targeted nominal test concentration.

Total alkalinity, EDTA hardness, and conductivity at test start were 52 mg/L as CaCO3, 126 mg/L as CaCO3, and 255 µmhos/cm for the dilution water

control and 50 mg/L as CaCO3, 126 mg/L as CaCO3, and 270 µmhos/cm for the limit test concentration, respectively. Dissolved oxygen concentrations throughout the test ranged from 7.0-9.9 mg/L for the dilution water control and 7.1-10.2 mg/L for the limit test concentration. pH throughout the test ranged from 7.0-7.2 for the dilution water control and 7.0-7.3 for the limit test concentration. Temperature ranged from 12.3-12.4°C for the dilution water control and for the limit test concentration.

No mortality or sublethal effects were seen at the 114 mg/L mean, measured concentration or in the dilution water control at the end of the 96-hour limit test.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

17.01.2006 (12)

Type :
Species : other: fish
Exposure period : 96 hour(s)
Unit : g/l
LC50 : 62200
Method : other: ECOSAR
Year :
GLP : no
Test substance : as prescribed by 1.1 - 1.4

Method : log10 Kow of -3.96
Remark : Reliability: Estimated value based on an accepted model.
17.01.2006 (26)

4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

Type :
Species : Daphnia magna (Crustacea)
Exposure period : 48 hour(s)
Unit : mg/l
EC50 : > 119
Analytical monitoring : yes
Method : OECD Guide-line 202
Year : 2005
GLP : yes
Test substance : as prescribed by 1.1 - 1.4

Method : The procedures used in the test were based on the recommendations of the following guidelines:

OECD Guideline 202 and

US EPA Pesticide Assessment Guidelines Subdivision E, 72-2.

The study was conducted with 5 concentrations and a dilution water control at a mean temperature of approximately 19.7°C. Four replicates with 5 daphnid neonates per replicate were used per test substance concentration and dilution water control.

Stock solutions were prepared by adding the test chemical to the dilution water under mechanical stirring. Test solutions were obtained by diluting the stock solutions. The stock solution and test solutions were clear and colorless with no visible precipitate. The concentration of the test solutions was determined at the beginning and end of the experiment via high performance liquid chromatography. Nominal concentrations of 7.5, 15,

30, 60, and 120 mg/L were chosen based on the results of a preliminary rangefinding study.

Observations of test organisms were made daily. The test solutions were not aerated, and temperature was maintained at approximately 19.7°C. Photoperiod was maintained at 16 hours light:8 hours dark.

Dissolved oxygen, pH, and temperature were measured in 2 replicates of the dilution water control and test substance concentrations at the beginning of the test and at test end. Total alkalinity, hardness (EDTA), and conductivity of the dilution water control and the highest test substance concentration were measured at the beginning of the test.

The 24- and 48-hour EC50 values were not calculated because immobility was < 50% at all test concentrations.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : Mean measured concentrations of 7.63, 14.9, 29.7, 59.6, and 119 mg/L resulted in 0, 0, 0, 0, and 5% immobility, respectively, at the end of 48 hours. Mean, measured concentrations ranged from 99 to 102% of the nominal concentrations.

No immobility was observed in the dilution water control daphnids. No sublethal effects were seen in any test group.

Total alkalinity, EDTA hardness, and conductivity at test start were 53 mg/L as CaCO3, 124 mg/L as CaCO3, and 280 µmhos/cm for the dilution water control and 52 mg/L as CaCO3, 127 mg/L as CaCO3, and 330 µmhos/cm for the 119 mg/L test concentration, respectively. Dissolved oxygen concentrations throughout the test ranged from 8.5-8.9 mg/L for the dilution water control and 8.6-8.9 for the test substance groups. pH throughout the test ranged from 7.4-7.7 for the dilution water control and 7.6-7.9 for the test substance groups. Temperature ranged from 19.7-19.8°C for the dilution water control and 19.6-19.8°C for the test substance groups.

The highest mean, measured concentration causing no immobility at test end was 59.6 mg/L. The lowest mean, measured concentration causing 100% immobility at test end was > 119 mg/L.

The 24-hour and 48-hour EC50's were > 119 mg/L.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

17.01.2006 (11)

Type :
Species : other: daphnid
Exposure period : 48 hour(s)
Unit : g/l
EC50 : 44200
Method : other: ECOSAR
Year :
GLP : no
Test substance : as prescribed by 1.1 - 1.4

Method : log10 Kow of -3.96
Remark : Reliability: Estimated value based on an accepted model.
17.01.2006 (26)

4.3 TOXICITY TO AQUATIC PLANTS E.G. ALGAE

Species	:	other algae: Pseudokirchneriella subcapitata
Endpoint	:	growth rate
Exposure period	:	72 hour(s)
Unit	:	mg/l
EC50	:	> 120
Limit test	:	
Analytical monitoring	:	yes
Method	:	OECD Guide-line 201 "Algae, Growth Inhibition Test"
Year	:	2005
GLP	:	yes
Test substance	:	as prescribed by 1.1 - 1.4

Method : The procedures used in the test were based on the recommendations of the following guideline: OECD Guideline 201.

The effect of the test substance on Pseudokirchneriella subcapitata was determined in a test with synthetic algal-assay-procedure (AAP) nutrient medium incubated in an environmental chamber at 24±2°C for 72 hours. Based on results of a range-finding study, which indicated < 50% growth inhibition at a nominal test concentration of 120 mg/L, a definitive limit study was conducted with a single nominal concentration of 120 mg/L. The measured concentration on study initiation was 117 mg/L. Three replicates were used for the culture medium blank control. Six replicates were used for the single test concentration. One replicate was used for the abiotic (stability) control.

Cell counts were conducted at 24-hour intervals. Healthy cell count, area under the growth curve, and growth rate were determined after 72 hours.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : EC50 (cell count): > 120 mg/L
EC50 (area under the curve): > 120 mg/L
EC50 (growth rate): > 120 mg/L

At test conclusion, healthy cell counts increased in the blank control by at least a factor of 16, thereby satisfying the appropriate test acceptance criteria. Mean cell count was 3.9x10E6 and 3.1x10E6 cells/mL after 72 hours for the blank control and 120 mg/L concentration, respectively. The % inhibition relative to control for the 120 mg/L group was 23, 24, and 4% for cell count, area under the curve, and growth rate, respectively.

The 72-hour NOEC for all three endpoints (cell count, area under the growth curve, and growth rate) was < 120 mg/L.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

17.01.2006 (13)

Species	:	other aquatic plant: Lemna gibba G3
Endpoint	:	other: growth and reproduction
Exposure period	:	7 day(s)
Unit	:	mg/l
NOEC	:	> 120
EC50	:	> 120
Limit test	:	
Analytical monitoring	:	yes
Method	:	other: OECD Guideline 221
Year	:	2005
GLP	:	yes
Test substance	:	as prescribed by 1.1 - 1.4

Method : A static-renewal limit study was conducted to determine the effect of the test substance on the growth and reproduction of duckweed, Lemna gibba

G3, a freshwater, floating vascular plant. The test was conducted in accordance with US EPA Pesticide Assessment Guidelines Subdivision J, 122-2, 123-2 (1982), which meets the requirements for the draft OECD 221 guideline (2004).

The effect of the test substance on Lemna gibba G3 was determined in a static-renewal test with twenty-strength synthetic algal-assay-procedure (20X AAP) nutrient medium incubated in an environmental chamber for 7 days at 25±2°C. Based on the results of a range-finding study, which indicated less than 50% growth inhibition at a nominal test substance concentration of 120 mg/L, a definitive limit study was conducted with a single nominal test substance concentration of 120 mg/L, measured at study initiation. The mean measured concentration was 105 mg/L. Three replicates were used for the culture medium blank control. Six replicates were used for the single limit test concentration. One replicate was for the abiotic (stability) control. Test solutions were renewed on test day 3. Frond counts were taken every 2 or 3 days. Frond count, frond count yield, biomass, and biomass yield were determined after 7 days. Yield was defined as the value of a measurement variable at the end of the exposure period minus the value of a measurement variable at the start of the exposure period, and was used to express a change in the measurement variable. Growth rate based on frond count and growth rate based on biomass were determined after 7 days.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : At test conclusion, healthy frond counts increased in the blank control by at least a factor of 7 in 7 days, thereby satisfying the appropriate test acceptance criteria.

Summary of results:

	Blank Control	120 mg/L
7-Day Mean Frond Number	162	164
% Inhibition		-1
7-Day Mean Frond Number Yield	147	149
% Inhibition		-1
7-Day Mean Biomass (mg)	15.25	16.41
% Inhibition		-8
7-Day Mean Biomass Yield (mg)	13.96	15.12
% Inhibition		-8
7-Day Growth Rate based on Frond Count	0.3401	0.3417
% Inhibition		0
7-Day Growth Rate based on Biomass	0.35273	0.36310
% Inhibition		-3

Conclusion:

Healthy Frond Count:	7-Day EC50 > 120 mg/L 7-Day NOEC > 120 mg/L
Healthy Frond Count Yield:	7-Day EC50 > 120 mg/L 7-Day NOEC > 120 mg/L
Biomass:	7-Day EC50 > 120 mg/L 7-Day NOEC > 120 mg/L

Biomass Yield: 7-Day EC50 > 120 mg/L
7-Day NOEC > 120 mg/L

Growth Rate based on Frond Count:
7-Day EC50 > 120 mg/L
7-Day NOEC > 120 mg/L

Growth Rate based on Biomass:
7-Day EC50 > 120 mg/L
7-Day NOEC > 120 mg/L

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

17.01.2006 (14)

Species : other algae
Endpoint :
Exposure period : 96 hour(s)
Unit : g/l
EC50 : 19600
Method : other: ECOSAR
Year :
GLP : no
Test substance : as prescribed by 1.1 - 1.4

Method : log10 Kow of -3.96
Remark : Reliability: Estimated value based on an accepted model.
17.01.2006 (26)

4.4 TOXICITY TO MICROORGANISMS E.G. BACTERIA

4.5.1 CHRONIC TOXICITY TO FISH

4.5.2 CHRONIC TOXICITY TO AQUATIC INVERTEBRATES

4.6.1 TOXICITY TO SEDIMENT DWELLING ORGANISMS

4.6.2 TOXICITY TO TERRESTRIAL PLANTS

4.6.3 TOXICITY TO SOIL DWELLING ORGANISMS

4.6.4 TOX. TO OTHER NON MAMM. TERR. SPECIES

4.7 BIOLOGICAL EFFECTS MONITORING

4.8 BIOTRANSFORMATION AND KINETICS

4.9 ADDITIONAL REMARKS

5.0 TOXICOKINETICS, METABOLISM AND DISTRIBUTION

5.1.1 ACUTE ORAL TOXICITY

Type	:	other: ALD
Value	:	> 11000 mg/kg bw
Species	:	rat
Strain	:	other: ChR-CD
Sex	:	male
Number of animals	:	
Vehicle	:	
Doses	:	670, 1000, 1500, 2250, 3400, 5000, 7500, 11,000 mg/kg
Method	:	
Year	:	1974
GLP	:	no
Test substance	:	other TS
Method	:	No specific test guideline was reported; however, a scientifically defensible approach was used to conduct the study. The test material, in original form, or as a solution in water, was administered to young adult male rats in single doses via intragastric intubation. Dose levels of 670, 1000, 1500, 2250, 3400, 5000, 7500, and 11,000 mg/kg were tested. One male rat was tested at each dose level. Survivors were sacrificed 13 or 14 days after dosing without pathological examinations.
Remark	:	Reliability: High because a scientifically defensible or guideline method was used.
Result	:	No mortality was observed. Lethargy was observed on the day of dosing at 7500 and 11,000 mg/kg. Slight initial weight loss was evident at 670, 1500, 3400, 7500, and 11,000 mg/kg.
Test substance	:	Product as shipped (which contains 42% F3455.HCl)

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5.1.2 ACUTE INHALATION TOXICITY

5.1.3 ACUTE DERMAL TOXICITY

5.1.4 ACUTE TOXICITY, OTHER ROUTES

5.2.1 SKIN IRRITATION

5.2.2 EYE IRRITATION

5.3 SENSITIZATION

5.4 REPEATED DOSE TOXICITY

Type	:	
Species	:	rat
Sex	:	male/female
Strain	:	other: Crl:CD®(SD)IGS BR
Route of admin.	:	gavage
Exposure period	:	Males: approximately 58 days Females: 14 days before mating to day 3 lactation
Frequency of treatm.	:	once daily
Post exposure period	:	
Doses	:	0, 50, 250, 1000 mg/kg
Control group	:	yes
NOAEL	:	250 mg/kg
Method	:	other: OECD Guideline 422
Year	:	2005
GLP	:	yes
Test substance	:	as prescribed by 1.1 - 1.4

Method : The procedures used in the test were based on the recommendations of the following guidelines:

OECD Guideline 422 and

U.S. EPA Health Effects Test Guidelines OPPTS 870.3650.

Male and female rats (12/sex/dose level; approximately 67 days old at the initiation of dosing) were administered an oral, daily dose of 0, 50, 250, or 1000 mg/kg/day. After 14 days of dosing, the rats were bred within their respective treatment groups and allowed to produce litters. The test substance was administered continuously to male and female rats during breeding, gestation, and lactation. Dams were allowed to deliver and rear their offspring until postpartum day 4.

Careful clinical observations were recorded once daily during dosing; detailed clinical observations were recorded once during pretest and weekly thereafter. Body weights and food consumption were recorded weekly for P1 males and females (premating), on days 0, 7, 14, and 21 of gestation and on days 0 and 4 of lactation; food consumption was not measured during cohabitation or thereafter for males, or for females with no evidence of copulation. An abbreviated neurobehavioral evaluation consisting of a functional observational battery (FOB) and motor activity (MA) was conducted in P1 rats (5/sex/group) once during pretest and on test day 10. Clinical pathology parameters were measured in P1 rats (5/sex/group) at the end of the premating period (hematology, clinical chemistry) and at terminal sacrifice (coagulation). F1 litter examinations (pup viability, individual pup weights, clinical observations) were performed at birth and on lactation day 4.

All P1 rats were given a gross pathological examination on test day 30 (males), postpartum day 4 (lactating females), and test day 48 (females that did not deliver a litter). The testes, epididymides, liver, kidneys, adrenals, thymus, spleen, brain, and heart from all rats sacrificed by design were weighed. Small and large intestines, stomach, bladder, lungs, trachea, heart, spleen, thymus, lymph nodes, bone marrow, thyroid, adrenals, brain, spinal cord, sciatic nerve, and femur were saved from all P1 rats. Gross observations and reproductive organs were also saved from all P1 rats. Uterine implantation sites and ovarian corpora lutea were counted in P1 females. A histological examination of reproductive organs was conducted on all animals in the control and 1000 mg/kg group. Histologic examination of all other tissues saved was conducted for

5/sex/group in the high-dose and control groups. Examination of tissues from the remaining groups was limited to relevant gross lesions and those tissues that demonstrated concentration-related histological effects in the 1000 mg/kg group.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : There were no effects considered to be related to treatment on the following parameters at any dose level:

mortality and clinical signs of toxicity in P1 males and females

body weight, body weight gain, food consumption and food efficiency in P1 males and females during premating, post-cohabitation, gestation, or lactation

FOB, motor activity, or grip strength in P1 males and females

hematology and coagulation parameters in P1 males and females, and clinical chemistry in P1 males

gross pathology in P1 males and females and organ weights in P1 males

microscopic pathology in P1 males and females.

Effects considered to be related to treatment were limited to the 1000 mg/kg group and comprised the following:

mildly increased triclyerides and moderately increased total bile acids in P1 females

small increase in liver weights in P1 females.

The NOEL for systemic toxicity was 250 mg/kg due to increased liver weights, triglycerides and total bile acids in P1 females at 1000 mg/kg.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

17.01.2006

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5.5 GENETIC TOXICITY 'IN VITRO'

Type : Bacterial reverse mutation assay
System of testing : Salmonella typhimurium strains TA98, TA100, TA1535, TA1537 and Escherichia coli strain WP2uvrA
Test concentration : 333, 667, 1000, 3333, 5000 ug/plate
Cycotoxic concentr. :
Metabolic activation : with and without
Result : negative
Method : OECD Guide-line 471
Year : 2005
GLP : yes
Test substance : as prescribed by 1.1 - 1.4

Method : The procedures used in the test were based on the recommendations of the following guidelines:

U.S. Environmental Protection Agency (EPA), Health Effects Test Guidelines, OPPTS 870.5100,

OECD Guideline 471,

European Commission Directive 2000/32/EC Annex 4D - B.13/14, and

MAFF Japan, Agriculture Chemicals Laws and Regulations, Japan (II), (59 NohSan Number 4200).

The test was performed in 2 phases. The first phase was the initial toxicity-mutation test, which was to establish the dose range for the main mutagenicity test, and to provide a preliminary mutagenicity evaluation. The second phase was the main mutagenicity test, which was used to evaluate and confirm the mutagenic potential of the test substance.

Sterile water was chosen as the dosing vehicle based on the solubility of the test substance and compatibility with the target cells. The test substance was soluble in sterile water at 50 mg/mL, the highest concentration tested in the study.

Positive controls included benzo[a]pyrene, 4-nitroquinoline N-oxide, acridine mutagen ICR-191, sodium azide, 2-aminoanthracene, and 2-nitrofluorene. The positive controls were dissolved in dimethyl sulfoxide (DMSO), except for sodium azide and ICR-191, which were dissolved in sterile water. The positive controls were assumed to be stable during this assay and no evidence of instability was observed.

In the initial toxicity-mutation test, the maximum dose of the test substance evaluated was 5000 µg/plate. This dose was achieved using a concentration of 50 mg/mL and a 100 µL aliquot. The eight dose levels were 33.3, 66.7, 100, 333, 667, 1000, 3333, and 5000 µg/plate.

In the main mutagenicity test, the maximum dose of the test substance evaluated in this test was 5000 µg/plate. This dose was achieved using a concentration of 50 mg/mL and a 100 µL aliquot. The five dose levels were 333, 667, 1000, 3333, and 5000 µg/plate.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : In the initial toxicity-mutation test, no precipitation, no toxicity, and no positive mutagenic responses were observed at any dose level or with any tester strain in either the presence or absence of S9 activation. Based on the toxicity-mutation test, the maximum dose plated in the mutagenicity test was 5000 ug/plate.

In the main mutagenicity test, no precipitation, no toxicity, and no positive mutagenic responses were observed at any dose level or with any tester strain in either the presence or absence of S9 activation, with the exception of one TA98-activated replicate at 667 ug/plate that showed slight toxicity.

All criteria for a valid study were met. No evidence of mutagenicity either in the presence or absence of Aroclor-induced rat liver S9 was indicated. The test substance was concluded to be negative in this study.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

17.01.2006

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Type : Chromosomal aberration test
System of testing : Human peripheral blood lymphocytes (HPBL)
Test concentration : 210, 1048, 2097 ug/mL
Cycotoxic concentr. :
Metabolic activation : with and without
Result : negative
Method : OECD Guide-line 473
Year : 2005
GLP : yes
Test substance : as prescribed by 1.1 - 1.4

Method : The procedure used in the test were based on the recommendations of the following guidelines:

U.S. Environmental Protection Agency (EPA), Health Effects Test Guidelines, OPPTS 870.5375,

OECD Guideline No. 473,

European Commission Directive 2000/32/EC Annex 4A-B10, and

MAFF Japan, Agriculture Chemicals Laws and Regulations, Japan (II), (59 NohSan Number 4200).

The test substance was prepared in water as this vehicle was determined to be the solvent of choice based on solubility of the test substance and compatibility of the target cells.

Positive controls included mitomycin C and cyclophosphamide. The positive controls were dissolved in sterile water. The positive controls were assumed to be stable during this assay, and no evidence of instability was observed.

Aliquots of the vehicle control and 3 test substance concentrations were taken to confirm dose concentrations and stability in the chromosome aberration study.

The maximum concentration tested in the preliminary toxicity assay based on the formula weight of the test substance was 10 mM (2097 µg/mL), the guidelined limit dose for this test system. The test substance formed a clear solution in water at 20.97 mg/mL, the highest stock concentration used in the assay.

In the preliminary toxicity assay, HPBL cells were treated for 4 and 20 hours in the non-activated test system and for 4 hours in the S9 activated test system. The cells were exposed to 9 concentrations of the test substance ranging from 0.2 to 2097 µg/mL (10 mM), as well as vehicle controls. The test substance concentrations for the chromosome aberration assay were selected based on an assessment of the potential reduction in the mitotic index in the treated cultures relative to the vehicle control.

In the chromosome aberration assay, the HPBL cells were treated for 4 and 20 hours in the non-activated test system and for 4 hours in the S9 activated test system. The cells were harvested 22 hours after initiation of the treatment.

Cytogenetic evaluations were conducted at 210, 1048, and 2097 µg/mL for all three testing conditions.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : Target concentrations were verified, and the test substance was stable for the duration of the dosing period.

In the preliminary toxicity assay, at concentrations of less than or equal to 2097 µg/mL, no visible precipitate was observed in the treatment medium. The pH and osmolality of the highest test substance concentration in media was not significantly different from the vehicle control either in the absence or presence of S9.

Substantial toxicity (at least a 50% reduction in mitotic index relative to the solvent control) was not observed at any concentration in any test system.

Based on these findings, the concentrations chosen for the chromosome aberration assay ranged from 21 to 2097 µg/mL for all 3 testing conditions.

In the chromosome aberration assay, the test substance was soluble in water at all concentrations tested. No visible precipitate was observed in the treatment medium at the beginning or end of the treatment period at any concentration (less than or equal to 2097 µg/mL) in any testing condition. Substantial toxicity (at least 50% reduction in mitotic index relative to the solvent control) was not observed at any concentration level in any testing condition. Selection of doses for microscopic analysis was therefore based on the guidelined 10 mM limit dose for this test system.

The percentage of cells with structural or numerical aberrations in the test substance-treated groups was not significantly increased above that of the solvent control at any concentration.

All criteria for a valid study were met. Under the conditions of this study, the test substance did not induce structural or numerical chromosome aberrations in the in vitro mammalian chromosome aberration test in human peripheral blood lymphocytes in the non-activated or S9 activated test systems. The test substance was concluded as negative in this in vitro test.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

17.01.2006

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5.6 GENETIC TOXICITY 'IN VIVO'

5.7 CARCINOGENICITY

5.8.1 TOXICITY TO FERTILITY

Type	:	other
Species	:	rat
Sex	:	male/female
Strain	:	other: Crl:CD(R)(SD)IGS BR
Route of admin.	:	gavage
Exposure period	:	Males: approximately 58 days Females: 14 days before mating to day 3 lactation
Frequency of treatm.	:	once daily
Premating exposure period		
Male	:	
Female	:	
Duration of test	:	
No. of generation studies	:	
Doses	:	0, 50, 250, 1000 mg/kg
Control group	:	yes
NOAEL parental	:	250 mg/kg bw
NOAEL F1 offspring	:	1000 mg/kg bw
Method	:	OECD combined repeated dose and reproductive/developmental toxicity screening test
Year	:	2005
GLP	:	yes
Test substance	:	as prescribed by 1.1 - 1.4

Method : The procedures used in the test were based on the recommendations of

the following guidelines:

OECD Guideline 422 and

U.S. EPA Health Effects Test Guidelines OPPTS 870.3650.

Male and female rats (12/sex/dose level; approximately 67 days old at the initiation of dosing) were administered an oral, daily dose of 0, 50, 250, or 1000 mg/kg/day. After 14 days of dosing, the rats were bred within their respective treatment groups and allowed to produce litters. The test substance was administered continuously to male and female rats during breeding, gestation, and lactation. Dams were allowed to deliver and rear their offspring until postpartum day 4.

Details for the subchronic portion, including dosing scheme, toxicological parameters studied, and statistical analyses can be found in Section 5.4.

Following the 14-day premating period, each female was continually housed with a randomly selected male of the same dosage group until evidence of copulation was obtained or until 2 weeks elapsed. Live and dead pups in each litter were counted as soon as possible after delivery was complete. Live pups in each litter were individually weighed. On day 4, offspring were individually handled and examined for abnormal behavior and/or appearance. Any dead, missing, or abnormal pups were recorded at each examination period. On day 4 postpartum, pup counts, weights, and external appearance were assessed and the litters were sacrificed and discarded without pathological evaluation. Other reproductive parameters recorded or calculated included mating, fertility and gestation indices, corpora lutea, and implantation site data.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : There were no effects considered related to treatment on the following parameters at any dose level:

mating, fertility, gestation length, corpora lutea, number of implantation sites, and implantation efficiency in the P1 generation

number of pups born, born alive, alive on day 4, sex ratio, and survival indices during the lactation period in F1 litters

clinical observations and mean pup weights on days 0-4 of lactation in F1 litters.

There were no test substance-related gross observations or causes of death determined from the gross examination of the F1 pups that did not survive until lactation day 4.

The NOEL for reproductive toxicity was 1000 mg/kg, the highest dose level tested. The NOEL for systemic toxicity was 250 mg/kg based on increased liver weights, triglycerides and total bile acids in P1 females at 1000 mg/kg.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

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5.8.2 DEVELOPMENTAL TOXICITY/TERATOGENICITY

Species : rat
Sex : male/female
Strain : other: Crl:CD®(SD)IGS BR
Route of admin. : gavage

Exposure period	:	Males: approximately 58 days Females: 14 days before mating to day 3 lactation
Frequency of treatm.	:	once daily
Duration of test	:	
Doses	:	0, 50, 250, 1000 mg/kg
Control group	:	yes
NOAEL maternal tox.	:	250 mg/kg bw
NOAEL teratogen.	:	1000 mg/kg bw
Method	:	other: OECD Guideline 422
Year	:	2005
GLP	:	yes
Test substance	:	as prescribed by 1.1 - 1.4

Method : The procedures used in the test were based on the recommendations of the following guidelines:

OECD Guideline 422 and

U.S. EPA Health Effects Test Guidelines OPPTS 870.3650.

Male and female rats (12/sex/dose level; approximately 67 days old at the initiation of dosing) were administered an oral, daily dose of 0, 50, 250, or 1000 mg/kg/day. After 14 days of dosing, the rats were bred within their respective treatment groups and allowed to produce litters. The test substance was administered continuously to male and female rats during breeding, gestation, and lactation. Dams were allowed to deliver and rear their offspring until postpartum day 4.

Details for the subchronic portion, including dosing scheme, toxicological parameters studied, and statistical analyses can be found in Section 5.4.

Following the 14-day premating period, each female was continually housed with a randomly selected male of the same dosage group until evidence of copulation was obtained or until 2 weeks elapsed. Live and dead pups in each litter were counted as soon as possible after delivery was complete. Live pups in each litter were individually weighed. On day 4, offspring were individually handled and examined for abnormal behavior and/or appearance. Any dead, missing, or abnormal pups were recorded at each examination period. On day 4 postpartum, pup counts, weights, and external appearance were assessed and the litters were sacrificed and discarded without pathological evaluation. Other reproductive parameters recorded or calculated included mating, fertility and gestation indices, corpora lutea, and implantation site data.

Remark : Reliability: High because a scientifically defensible or guideline method was used.

Result : There were no effects considered related to treatment on the following parameters at any dose level:

mating, fertility, gestation length, corpora lutea, number of implantation sites, and implantation efficiency in the P1 generation

number of pups born, born alive, alive on day 4, sex ratio, and survival indices during the lactation period in F1 litters

clinical observations and mean pup weights on days 0-4 of lactation in F1 litters.

There were no test substance-related observations determined from the external examination of the pups sacrificed by design lactation day 4.

There were no test substance-related gross observations or causes of death determined from the gross examination of the F1 pups that did not

survive until lactation day 4.

The NOEL for reproductive toxicity or developmental toxicity, based on this screening assay, was 1000 mg/kg, the highest dose level tested. The NOEL for systemic toxicity was 250 mg/kg based on increased liver weights, triglycerides and total bile acids in P1 females at 1000 mg/kg.

Test substance : Carbamic acid, [(dimethylamino)iminomethyl]methyl-,ethyl ester, monohydrochloride, purity 100%

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5.8.3 TOXICITY TO REPRODUCTION, OTHER STUDIES

5.9 SPECIFIC INVESTIGATIONS

5.10 EXPOSURE EXPERIENCE

5.11 ADDITIONAL REMARKS

6.1 ANALYTICAL METHODS

6.2 DETECTION AND IDENTIFICATION

7.1 FUNCTION

7.2 EFFECTS ON ORGANISMS TO BE CONTROLLED

7.3 ORGANISMS TO BE PROTECTED

7.4 USER

7.5 RESISTANCE

8.1 METHODS HANDLING AND STORING

8.2 FIRE GUIDANCE

8.3 EMERGENCY MEASURES

8.4 POSSIB. OF RENDERING SUBST. HARMLESS

8.5 WASTE MANAGEMENT

8.6 SIDE-EFFECTS DETECTION

8.7 SUBSTANCE REGISTERED AS DANGEROUS FOR GROUND WATER

8.8 REACTIVITY TOWARDS CONTAINER MATERIAL

(1) "Improved Method for Estimating Bioconcentration Factor (BCF) from Octanol-Water Partition Coefficient", SRC TR-97-006 (2nd Update), July 22, 1997; prepared for: Robert S. Boethling, EPA-OPPT, Washington, DC; Contract No. 68-D5-0012; prepared by: William M. Meylan, Philip H. Howard, Dallas Aronson, Heather Printup and Sybil Gouchie; Syracuse Research Corp.

(2) AOPWIN, v. 1.91 module of EPIWIN 3.11.

(3) Boethling, R. S. et al. (1994). Environ. Sci. Technol., 28:459-65.

(4) DuPont Co. (1974). Unpublished Data, Haskell Laboratory Report No. 70-74 "Acute oral test" (February 13).

(5) DuPont Co. (1996). Material Data Safety Sheet No. B0000006 (May 24).

(6) DuPont Co. (2000). Unpublished Data.

(7) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-14630, "Assessment of ready biodegradability by the modified sturm test" (May 16).

(8) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-14631, "Hydrolysis at pH 4, 7, and 9" (December 21).

(9) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-14936, "Bacterial reverse mutation test" (March 28).

(10) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-14938, "In vitro chromosome aberration test in human peripheral blood lymphocytes" (April 27).

(11) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-15943, "Static, acute, 48-hour toxicity test to Daphnia magna" (May 6).

(12) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-15944, "Static, acute, 96-hour limit test to rainbow trout, Oncorhynchus mykiss" (May 5).

(13) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-15945, "Influence on growth and growth rate of the green alga Pseudokirchneriella subcapitata" (May 4).

(14) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-15946, "Influence on growth and reproduction of Lemna gibba G3" (June 3).

(15) DuPont Co. (2005). Unpublished Data, Haskell Laboratory Report No. DuPont-17246, "Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test in rats" (December 19).

(16) Harris, J. C. (1990). Rate of Aqueous Photolysis, Chapter 8 In Lyman, W. J. et al. (eds.). Handbook of Chemical Property Estimation Methods, American Chemical Society, Washington, DC.

(17) Hine, J. and P. K. Mookerjee (1975). J. Org. Chem., 40(3):292-8.

(18) Howard, P. H. et al. (1987). Environ. Toxicol. Chem., 6:1-10.

(19) Howard, P. H. et al. (1992). Environ. Toxicol. Chem., 11:593-603.

(20) Mackay, D. (1991). Multimedia Environmental Models: The Fugacity Approach, pp. 67-183, Lewis Publishers, CRC Press.

(21) Mackay, D. et al. (1996). Environ. Toxicol. Chem., 15(9):1618-1626.

(22) Mackay, D. et al. (1996). Environ. Toxicol. Chem., 15(9):1627-1637.

(23) Meylan, W. and P. H. Howard (1991). Environ. Toxicol. Chem., 10:1283-93.

(24) Meylan, W. M. and P. H. Howard (1993). Chemosphere, 26:2293-99.

(25) Meylan, W. M. and P. H. Howard (1995). J. Pharm. Sci., 84:83-92.

(26) Meylan, W. M. and P. H. Howard (1999). User's Guide for the ECOSAR Class Program, Version 0.993 (Mar 99), prepared for J. Vincent Nabholz and Gordon Cas, U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, Washington, DC, prepared by Syracuse Research Corp., Environmental Science Center, Syracuse, NY 13210 (submitted for publication).

(27) Mill, T. et al. (1987). "Environmental fate and exposure studies development of a PC-SAR for hydrolysis: esters, alkyl halides and epoxides" EPA Contract No. 68-02-4254, SRI International Menlo Park, CA.

(28) Tunkel, J. et al. (2000). "Predicting ready biodegradability in the MITI test" Environ. Toxicol. Chem., accepted for publication.

10.1 END POINT SUMMARY

10.2 HAZARD SUMMARY

10.3 RISK ASSESSMENT